

1 ABSTRACT

2 A grating-stabilized semiconductor laser comprises a semiconductor laser gain
3 medium, an integrated low-index waveguide, and a waveguide grating segment
4 providing optical feedback for laser oscillation. The laser may be adapted for multi-
5 mode or single-mode operation. A multiple-mode laser may oscillate with reduced
6 power and/or wavelength fluctuations associated with longitudinal mode wavelength
7 shifts, relative to Fabry-Perot lasers lacking gratings. A single-mode laser may include
8 a compensator, wavelength reference, and detector for generating an error signal, and
9 a feedback mechanism for controlling the compensator for maintaining the laser
10 wavelength locked to the reference. The laser may include means for altering,
11 enhancing, tuning, and/or stabilizing the waveguide grating reflectivity spectral profile.
12 The laser may be adapted for optical transverse-coupling to another waveguide.